MATH1040 Assignment 3

All questions should be submitted by 5pm on Thursday 14 December. You should show full working where possible. Assignments can be submitted during your tutorial or to the MATH1040 assignment box on the 3rd floor of the Priestley Building (#67). Make sure that your name and student number are on each sheet of your answers. Solutions will be distributed in class later.

1. Factorise $4fhm + 10f^2hmt$

2. Simplify the following expression:
   a) $\frac{2x + 6}{(x + 3)(x - 3)}$

3. The final velocity of an object is given by the formula $v = u + at$, where $u$ is the initial velocity, $a$ is the acceleration and $t$ is time. Find the final velocity of an object if $u = 4$, $a = 9.8$ and $t = 5$.

4. Evaluate each of the following (previous exam question):
   a) $( -2)^3$  b) $( -3)^4$  c) $2^4$  d) $(-2)^3$
   e) $x^2 + x$ where $x$ is 2  f) $-(x^2) + x$ where $x$ is 2
g) $(-x^2) + x$ where $x$ is 2

5. Solve the following equations:
   a) $4r = 2r + 10$  b) $3(j + 2) = 4(j - 3)$  c) $\frac{5}{2} + 4 = 9$

6. Solve $| -3x + 2 | = 11$

7. Find all $x$ which satisfy $5x + 2 > 3x - 4$.

8. Simplify a) $\left(\frac{\sqrt[3]{5}}{\sqrt[5]{3}}\right) \times \left(\frac{\sqrt[4]{3}}{\sqrt[5]{3}}\right)$  b) $2\sqrt{3} \times 4\sqrt{6}$

9. Simplify a) $x^2y^3 \times x^4y^2 \div (x^6y^4)$  b) $(p^2q^3)^2 \times p^4q^2 \div (pq)^8$

10. Write each of the following in summation notation:
    a) $2h + 4h + 6h + 8h + 10h$ (previous exam question)
    b) $-\frac{1}{8} + -\frac{1}{6} + -\frac{1}{4} + -\frac{1}{2}$ (previous exam question)

11. After the recent Ashes Test at the Gabba, a depressed English supporter went to the pub. He drank five beers, each containing one unit of alcohol. Then he started drinking scotch, each glass containing three units of alcohol.
    a) Let $x$ be the number of glasses of scotch he drinks. Write an expression, involving $x$, for the number of units of alcohol he drinks (don’t forget the beer!).
    b) If he drinks 23 or more units of alcohol, he will pass out. If he drinks less than 14, he will stay too sober and will be depressed. Assume he doesn’t want to stay depressed and doesn’t want to pass out. Write the problem of deciding how many glasses of scotch he can drink in inequality form.
    c) Solve the inequalities from (b). Write your answer in interval format. Finally, mark your answer on a number line.